

Abstract Submitted
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Adaptive Tabulation for Verified Equations of State JOHN H. CARPENTER, Sandia National Laboratories* — For over forty years, large hydrodynamic calculations have used tabulated equation of state (EOS) models to reduce the computation cost associated with complex EOS models. Ideally, these tables would be verified, in that values interpolated from them match the direct EOS model calculations within some level of accuracy. For typical rectangular-gridded tables, and associated interpolation schemes, the verification error is often found to be quite large. Outstanding issues include grid coarseness and difficulty in reproducing phase boundary topology. Decreasing the grid spacing quickly becomes inefficient, due to increasing storage requirements. Instead, a tabulation approach is demonstrated that naturally incorporates the phase boundary topology through a triangulated interpolation domain. A given verification level as well as thermodynamic consistency and stability are ensured through an adaptive refinement process. Improvements are demonstrated on a simple multi-phase EOS model.

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John H. Carpenter
Sandia National Laboratories

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